IGPPS Center Science of Signatures Seminar Series

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Nuclear Forensics Driven by Geographic Information Systems and Big Data Analytics

Thursday, February 26, 2015

1:00-2:00 PM

Research Park, 2nd Floor, 203B Conference Room

ABSTRACT: Numerous entities have recently established themselves to enable citizen scientists to collect radiation data that is temporally and geographically tagged. The available detectors range from commercially-available systems to self-assembly kits to commercial apps on smart devices. These developments, fueled on events like the Fukushima nuclear disaster, are resulting in the creation of large, GIS-based radiation sensor networks – big data. This paper focuses on how such networks can be leveraged for nuclear forensics purposes. We shall present data from some of these networks and describe how the coupling in of other data sets is necessary for nuisance alarm adjudication. Emphasis will be placed on the benefits of GIS techniques and big data analytics for improving the statistics provided in the receiver operating characteristic (ROC) curve.

Biography: Clair J. Sullivan is an Assistant Professor in the Department of Nuclear, Plasma and Radiological Engineering, at the University of Illinois at Urbana-Champaign (UIUC). Her research interests include radiation detection and measurements; gamma-ray spectroscopy; automated isotope identification algorithms; big data analytics; sensor networks; nuclear forensics; nuclear security; nuclear nonproliferation; and new materials for radiation detection. She is the Director of Radiation Detection and Isotope Identification research group at UIUC, focused on applications in nuclear security and forensics. She also serves as an Associate Editor of IEEE Transactions on Nuclear Science. Prior to joining the faculty of UIUC in 2012, she obtained a decade of experience as both a researcher and practitioner applying her background to the fields of nuclear emergency response, intelligence, and homeland security. She spent seven years at Los Alamos National Laboratory (LANL) and three years working for the federal government. She recently was awarded the DARPA Young Faculty Award, recognizing "rising research stars in junior faculty positions at U.S. academic institutions."

For more information contact the technical host, Jon Schoonover, schoons@lanl.gov, 665-0772

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